

HINTERLAND WHO'S WHO

THE CANADA GOOSE

Canadian Wildlife Service

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## WHO'S WHO



Cackling Canada goose (left) and giant Canada goose (right) — the smallest and largest of the races of Canada geese. A white-fronted goose in the rear. Photo by H. C. Hanson

## The Canada goose

(*Branta canadensis*)

The appeal of the Canada goose is legendary. The spectacle of the birds migrating in long, honking, irregular "V" formation across spring or autumn skies is always thrilling. They are one of the most dramatic portents of the change of seasons in Canada.

To the Cree Indians of the Hudson Bay lowlands, who hunted the Canada geese on their way north each April, the arrival of the birds marked the end of winter privation and scarcity, and sometimes even meant relief from starvation. Spring migration brought similar, though less crucial, encouragement to the early Canadian settlers, weary of winter. Today, few species of North American birds



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are so widely distributed over the continent, are comprised of so many varieties or races, and provide so much opportunity to explore the mysteries of bird biology.

### **Varieties and distribution**

Although hunters and bird-watchers commonly recognize three sizes of Canada goose – the large “Honker”, the lesser Canada goose, and the Hutchin’s or, in the West, the cackling Canada goose – there are actually 20 “races”, or subspecies, of this wonderful bird.

Most of these races are surprisingly distinctive. For instance, they range in weight from 2½ to 18 pounds, and in wingspread from about 3 to 6½ feet. They vary in colour from a light pearl-grey to a chestnut-brown and even a blackish brown. However, all the races have whitish cheek patches and a black head, crown, and neck. Variations in body proportions, particularly the relative length of the neck, shape of the body, and the body stance, further distinguish the different races. In general, the larger the race the longer the neck and the more elongated the body; the smallest races have very short necks and compact, almost blocky bodies. What is considered the Canada goose by the layman in one region is often a quite different bird from what is considered a typical Honker in another region.

The range of the species extends from the outermost Aleutian Islands east to Newfoundland and the New England states (formerly), and from Kansas and Tennessee in the south, north to southern Victoria Island and southern and southwestern Baffin Island. The southern portions of this range east of the Rockies were once occupied by the giant Canada goose (*Branta canadensis maxima*). It was all but exterminated from the U.S. sector of its range by the early 1920’s. Fortunately, some remnants of this goose, thought to be extinct until 1962, survived. It is now being restored to much of its former range. However, this vast over-all range is actually highly fragmented, each race preferring its own special habitat type. The ranges are separated by well-defined natural barriers – high mountainous country, glaciers, deserts, or heavily wooded and rocky country – all of which are generally unsuitable for nesting geese.



Approximate limits of former and present breeding range of Canada goose

### **Relation of size to distribution**

The distribution and size of these races vary closely with the climate of their breeding grounds. A goose breeding in the far North must complete nesting, rearing of young, and moulting (replacement of flight feathers) in a comparatively short period of time between spring melt and winter freeze-up. Studies have shown that the smaller races of these geese have shorter incubation periods, shorter fledgling periods, and because their flight feathers are shorter they require less time to grow to the flight stage after moult. Consequently, there is a selection for smaller races with shorter breeding and moulting periods as the climate on the breeding area becomes progressively more severe. For example, the giant Canada goose – the race of the Great Plains and the Mississippi Valley – requires 28–30 days for incubation, 70–80 days for rearing of young, and 40 days for the adult moult. The smallest race, the cackling Canada goose (*Branta canadensis minima*) requires only about 25, 42, and 24 days respectively for those stages.

There is a general rule in biology (Bergmann’s rule) that in resident species, because of the necessity to conserve heat, colder

climates select for large races which have a lesser area of body surface relative to body weight than do smaller races. In winter the various races of the migrant Canada geese are distributed in accordance with this rule. The giant Canada goose, the southernmost breeding subspecies, migrates the shortest distance and many populations winter on the central portions of the Great Plains as long as spring-fed streams and food are available. Some populations of the smallest races which nest in the eastern and central Canadian Arctic travel all the way to the southern United States and even northeastern Mexico to spend the winter. Thus, it is principally a *time* factor that selects for the size of the subspecies that nest in the various portions of the breeding range of the Canada goose, and principally a *temperature* factor that determines the distribution of these races or subspecies in winter.

The habits of the Canada goose can be dealt with by describing a subspecies known as the Honker (*Branta canadensis interior*) that nests in the Hudson Bay region and winters in the Mississippi Valley.

### **Spring migration period**

The vast muskeg region of northern Ontario bordering the west coast of James Bay and the south coast of Hudson Bay is the magnet which seems to draw the Honkers northward each spring to nest. These geese reach their breeding grounds in late April, several weeks before the break-up of the major rivers. Their arrival so characterizes this month that it is known to the Cree Indians as "niskapesim" or goose moon. At this time there may still be several feet of snow in the bush.

While waiting for the snow and ice to clear from portions of the interior muskeg where they will nest, the early arriving geese fly back and forth between open spots along the rivers. To feed, they often resort to snow-free areas in the muskeg where they consume sedges and berries remaining from the previous autumn. The Canada's are hardy birds and having put on a layer of fat before migration are easily able to sit out extended periods of severe weather. Even so, spring in the North is often capricious; late blizzards may force the advance flocks to retreat southward several times before they finally reach their breeding grounds.

### **Breeding habitat**

The great muskeg, as their breeding grounds have aptly been called, is a country nearly impassable to humans on foot. It is referred to by geographers as the Hudson Bay lowlands. Largely a waterlogged plain, 125,000 square miles in extent and lying only a few feet above sea level, its surface varies from scattered blocks of stunted spruce and tamarack to large areas of bogs and pothole lakes. Because floating mats of sedges and grasses cover much of the water areas its appearance is often deceptive, and the Cree Indians who hunt and trap the muskeg may suddenly plunge hip deep in cold water.

However, not all of this lonely muskeg land of the North is attractive to pairs of nesting geese. Extensive bogs and large lakes in themselves usually do not constitute ideal nesting habitat; rather it is the patches of closely lying pothole lakes which have one or more small islands that appear to be the most attractive to nesting geese. In choosing such lakes, the mated pairs could not seek out more beautiful country for their summer sojourn.

Nest sites are frequently located on islands or islets, often close to woody vegetation and usually within a few feet of water. However, in some areas nests may be located out on waterlogged sedge—grass muskeg plains at considerable distance from any sizable pond or lake. Usually five to seven eggs are laid, with older birds producing larger clutches than birds nesting for the first time.

Although the factors which affect success of the nesting season have yet to be fully determined, weather conditions are undoubtedly very important. In some years the relative number of pairs that produce young may be as little as one-third that found in other years. However, because geese do not breed until two years of age, alternate annual variations in the age structure of a population are a normal phenomenon. For example, a bumper crop of young one year is certain to lower the percentage of geese of breeding age in the population the following year; conversely, two years later the addition of these geese to the breeding segment of the population results in another large crop of young which again reduces the percentage of geese of breeding age in the wintering population.

Canada geese are potentially long-lived,

particularly the giant Canada goose for which there are numerous records of captive individuals living to 40 and occasionally 60 years. However, in the wild, the average age – due in part to heavy hunting – is usually less than two or three years, although there are several instances of banded geese (*B. c. interior*) attaining at least 22 years.

### **Behaviour**

Like most birds, the Canada goose is a curious mixture of sociability and intolerance of others of its kind. In breeding areas where the habitat is limited and nesting islands are scarce, as in some sections of the West, Canada geese will nest in close proximity. In the North, where lakes with islands are numerous, each pair will reserve a lake to itself, or in the case of the larger lakes, a bay or comparable section. Some may nest in boggy areas at a considerable distance from water, but most pairs are well separated from each other.

While the female undertakes the chore of incubating the eggs, the male stands guard somewhere in the vicinity. In the muskeg of northern Ontario, the male is usually seen several hundred yards from the nest. After a 28-day period, during which time the female leaves the nest only briefly each day to feed, the eggs are hatched.

Soon after the young have hatched, the families seem to obey an urge to leave the nesting area. The adults are flightless at this time, of course, because they are moulting and growing new primary feathers on their wings. Those in the far interior of the muskeg, which constitute the bulk of the Mississippi Valley Flyway population, wander from lake to lake, feeding on grasses and sedges as they cross the intervening stretches of floating sedge mats. If the geese have nested near the sea coast, they often descend the rivers to more favourable coastal marsh and tundra feeding areas. When rapids are encountered, the birds travel overland to the next stretch of calm water.

A pair with their young of the year is an inseparable troupe, acting in unison almost as a single biological unit. In moving about, the female leads the way, followed by the young, with the gander bringing up the rear. When another goose family ventures too close and appears to be competing for the same feed-

ing area, "battle formation" is assumed, the male acting as the head of a V-like phalanx, ready to do physical battle while the female and young assume threatening postures behind him. The gander literally defends the ground he and his family walk on, plus a few square feet of surrounding area. A fancied infringement of such indefinite moving territories by other geese may be the cause for a battle royal between the ganders of the two families. Curiously enough, the victor of such encounters can be predicted with such statistical assurance that if money were wagered, the observer "in the know" would be sure of a profit. In encounters between the ganders of two families, the psychology of strength in numbers seems to be the decisive factor – not the apparent size or weight of the antagonists. Thus male geese with large families almost always defeat males with small families, whether the ganders actually fight or merely threaten each other.

### **Late summer and autumn migration period**

During this period of wandering, the young goslings grow their flight feathers, while the adults moult and regrow theirs. The family remains grounded until early August when the birds are ready to take to the air as a family unit. Some families remain inland, while others fly to the shores of Hudson and James Bays where they feed on berries and put on a layer of fat prior to their southward migration. There they are joined by tens of thousands of blue and snow geese that have nested in the Arctic.

Some of the Canada geese linger on the shores of Hudson and James Bays until early October and then suddenly in the space of a few days they are gone. Those that have flocked along James Bay follow the coastline south. The inland geese tend to follow the north- and south-trending rivers. A few days' flight returns them to their autumn and winter quarters in the United States, which in most cases are federal, state, and private refuges.

### **Research and management**

Banding is one of the important tools of waterfowl research. From the reports of hunters who have shot banded waterfowl, it has been learned that the migrations of geese, unlike those of ducks, follow restricted systems of flyways or routes of migration which return

them to the same wintering and breeding grounds each year. From the standpoint of management, this means that should a flyway population of geese be severely depleted – and this could be a subspecies dangerously limited in size – an influx of birds from other areas cannot be depended upon for rebuilding its numbers.

The Canada goose populations which nest more or less continuously inland from the coasts of Hudson and James Bays, from Churchill in the northwest to the Ungava Peninsula at the northeast end of Hudson Bay, typify the adherence of geese to their ancestral flyways. Band recoveries from members of this extensive population reveal that they belong to four different flyway populations.

The geese of the South Atlantic Flyway nest inland from the east coast of Hudson Bay. They fly southeastward from the end of James Bay and winter on Chesapeake Bay and the coastal areas of Virginia and North Carolina.

The geese of the Southeast Flyway nest around the east and south sides of James Bay and on Akimiski and Charlton Islands. They winter inland along the rivers and reservoirs of South Carolina, Tennessee, Georgia, and Alabama.

The Canada geese of the Mississippi Flyway nest in the muskeg south of Hudson Bay and west of James Bay. This population winters close to the Mississippi River, chiefly near the southern tip of Illinois, even though prior to the development of the waterfowl refuges in southern Illinois they did not winter farther south than Memphis, Tennessee.

The geese of the Eastern Prairie Flyway nest in northeastern Manitoba south of Churchill and migrate chiefly through Minnesota and Iowa to winter in central Missouri and southward to the coast of the Gulf of Mexico.

Research and management are paying substantial dividends in the restoration of Canada goose populations that have been depleted by excessive hunting. Research is showing the biological basis on which Canada geese must be managed. Management, by annual assessment of the production of young, a quota system limiting kills in the flyway, post-season population inventories, and long-term programs of refuge acquisition

and development, is assuring the future of these birds. From an all-time population low of 22,000 in 1946, the Canada goose population in the Mississippi Valley Flyway has reached about 300,000. The total continental population of all races of Canada geese may, in some years, be as high as a million birds.

For those who have followed and participated in this conservation program, perhaps one of the most rewarding aspects of the experience has been in the smiles of Cree Indians when they report that "there are more than ever".

### **Reading list**

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- Honker. Cecil S. Williams. D. Van Nostrand Co., Princeton and Toronto, 1967.
- The giant Canada goose. Harold C. Hanson. Southern Illinois University Press. Carbondale and Edwardsville. 1965.

### ***How does the Canadian Wildlife Service fit into the national wildlife picture?***

The Canadian Wildlife Service carries out both wildlife research and management. As a branch of the Department of Indian Affairs and Northern Development, it is entrusted with federal responsibilities for wildlife, a renewable resource of ever-increasing importance to the national welfare and economy.

Each province has control over the natural resources within its boundaries, including wildlife. However, because Canada signed the Migratory Birds Treaty with the United States in 1916, there is a federal responsibility for the management and protection of

migratory birds. The Canadian Wildlife Service administers the Migratory Birds Convention Act and Regulations for the federal government. In practice, federal and provincial governments co-operate in all matters concerning migratory birds. The Canadian Wildlife Service studies migratory birds throughout Canada and conducts scientific research into other wildlife problems in the Northwest Territories, the Yukon Territory, and Canada's National Parks; it also co-operates with administrative agencies when wildlife management programs indicated by research are instituted.

The Wildlife Service staff includes mammalogists, ornithologists, limnologists, pathologists, a pesticide investigator, and a biometrician. The head office is in Ottawa and there are regional offices in Edmonton and Ottawa. Smaller offices are located at Fort Smith and Inuvik, Northwest Territories; Whitehorse, Yukon Territory; Vancouver, British Columbia; Calgary, Alberta; Saskatoon, Saskatchewan; Winnipeg, Manitoba; Aurora, Ontario; Ste-Foy, Quebec; Fredericton and Sackville, New Brunswick; Halifax, Nova Scotia; and St. John's, Newfoundland.

The Service administers 94 migratory bird sanctuaries throughout Canada. It is now participating with the provinces in a major program of preserving, by purchase and long-term lease, wetlands necessary to migratory birds for breeding and for resting during migration.

A National Wildlife Policy and Program was announced on April 6, 1966, that provides for expanded research and management in co-operation with the provincial game agencies and other interested organizations.

For further information on wildlife in your province please contact your chief provincial game officer.

### *Additional notes*

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# Canada Goose



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Few species of North American birds are so widely distributed over the continent, are comprised of so many varieties or races, and provide so much opportunity to explore the mysteries of bird biology.

#### *Varieties and distribution*

Many people can recognize a Canada Goose by its characteristic black head and crown, long black neck and whitish cheek patches. However, there are probably more than 20 subspecies of this wonderful bird, so a Canada Goose in one region may be quite a different bird from a Canada Goose in another.

Most of these races are surprisingly distinctive. They range in size from the large forms such as the deep-voiced honkers, to the small forms with high-pitched cackling voices. The weights of the various races range from two and a half to 18 pounds and their wingspreads from about three to six and a half feet. They vary in colour from a light pearl-grey to a chestnut, and even a blackish brown. Variations in body proportions, particularly the relative length of the neck, body shape and body stance, further distinguish the different races. In general, the larger the race the longer the neck and the more elongated the body; the smaller races have very short necks and compact, almost blocky bodies. However, all the races have whitish cheek patches and a black head, crown and neck.

The breeding range of the Canada Goose extends in Canada from the Yukon east to Newfoundland, and from southern Victoria Island and southern Baffin Island to the U.S.-Canada border in the west, and northern Ontario and Quebec in the east. They are not usually seen, except during

migration, in southern Ontario and Quebec, nor in the three Maritime Provinces. A few Canada Geese winter in southern Canada, but most travel farther south, to refuges in the United States, or even to northeastern Mexico.

This vast range is highly fragmented, each race preferring its own special habitat. The ranges of various races are separated by well-defined natural barriers — high mountainous country, glaciers, deserts, or heavily wooded and rocky country — all of which are generally unsuitable for nesting geese.

#### *Relation of size to distribution*

The distribution and size of these races vary closely with the climate of their breeding grounds. The smaller races require less time to incubate and hatch their eggs, less time to rear their young and less time for the adults to moult and replace their flight feathers. For example, the giant Canada Goose — the race of the Great Plains and the Mississippi Valley — requires 28–30 days for incubation, 70–80 days for rearing of young and 40 days for the adult moult. The smallest race, the cackling Canada Goose, requires only about 25, 42 and 24 days for the same stages.

A goose breeding in the far north must complete nesting, rearing of young and moulting in a comparatively short period of time between spring melt and winter freeze-up. Consequently, there is a selection for smaller races with shorter breeding and moulting periods as the climate on the breeding area becomes progressively more severe.

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### Nesting

Usually five to seven eggs are laid, with older birds producing more eggs than birds nesting for the first time.

The female incubates the eggs for 28 days, while the male stands guard nearby. In the muskeg of northern Ontario, the male is sometimes several hundred yards or more from the nest. During the nesting period the female leaves the nest only briefly each day to feed.

Nesting success is undoubtedly influenced by weather conditions. It may also be affected by variations in behaviour related to the density of the population.

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Soon after the young have hatched, the families leave the nesting area. The adults are flightless at this time because they are moulting and regrowing their flight feathers. Those in the far interior of the muskeg wander from lake to lake, feeding on grasses and sedges as they cross the intervening stretches of floating sedge mats. If the geese have nested near the sea coast, they often descend the rivers to more favourable coastal-marsh and tundra feeding areas. When rapids are encountered, the birds travel overland to the next stretch of calm water.

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Some of the Canada geese linger on the shores of Hudson and James bays until early October and then suddenly in the space of a few days they are gone. Those that have flocked along James Bay follow the coastline south. The inland geese tend to follow the north- and south-trending rivers. A few days' flight returns them to their autumn and winter quarters.

### Research and management

Banding - placing a numbered aluminum band around the leg of a bird - is one of the important tools of waterfowl research. Band returns from hunters who have shot banded waterfowl indicate that the migrations of geese, unlike those of ducks, follow restricted systems of flyways or routes of migration which return them to the same wintering and breeding grounds each year. Therefore, if a flyway population of geese is severely depleted, an influx of birds from other areas cannot be counted upon to rebuild its numbers.

The Canada goose populations which nest more or less continuously inland from the coasts of Hudson and James bays, and from Churchill in the northwest to the Ungava Peninsula at the north-east end of Hudson Bay, belong to four different flyway populations, which winter all the way from coastal Virginia and North Carolina, through the southern states, west to Illinois and north-central Missouri.

Research and management are paying substantial dividends in the restoration of Canada goose populations depleted by excessive hunting. Research is showing the biological basis on which Canada geese must be managed. Management is assuring the future of these birds by annual assessment of the production of young, a quota system limiting kills, winter population inventories, and long-term programs of refuge acquisition and development. From an all-time population low of 22,000 in 1946, the Canada goose population in the Mississippi Valley Flyway has reached about 300,000. The total continental population of all races of Canada geese may, in some years, be as high as 1.5 million birds. For the many admirers of this elegant bird, the success of this management program is most reassuring.

How does the Canadian Wildlife Service fit into the national wildlife picture?

The Canadian Wildlife Service conducts wildlife research and management for the federal government. Each province controls the natural resources, including wildlife, within its boundaries. However, because of the Migratory Birds Treaty, signed in 1916 with the U.S.A., the federal government is responsible for management and protection of migratory birds. CWS administers the Migratory Birds Convention Act and Regulations but co-operates with provincial governments in doing so.

CWS studies migratory birds throughout Canada and conducts scientific research into other wildlife problems in the Northwest Territories, the Yukon Territory and the national parks. The National Wildlife Policy and Program, announced in April 1966, provided for expanded research and management by the service, in co-operation with provincial game agencies and other organizations.

The staff includes mammalogists, ornithologists, limnologists, pathologists, a biometrician and a pesticides unit. The head office is in Ottawa; regional offices are located in Edmonton and Ottawa, with smaller offices across Canada, from Whitehorse, Yukon Territory, to St. John's, Newfoundland.

CWS administers over 90 migratory bird sanctuaries throughout Canada and participates with the provinces in a major program for preserving, by purchase and long-term lease, wetlands necessary to migratory birds for breeding and for resting during migration.

For further information on wildlife in your province, please contact the director of your provincial fish and wildlife department.

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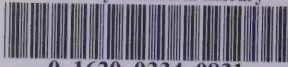
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